

I. Amendments to the Specification

Please replace paragraph [005] with the following replacement paragraph:

[005] To facilitate the making of a large number of measurements, either sequential or concurrent, it is common practice to use multi-conductor cables, each with a series of ground contact points (or take-outs), at intervals along the cable. For each individual measurement a selection of ground contact points has to be made, namely two for passing current into the ground (current electrodes) and two for measuring the resultant ground voltages (potential electrodes). Older instruments employed for this purpose utilized cables with as many conductors as there were take-outs, and with all of the conductors terminating at a switch box of an electronic console, at the position of the survey operator. In such instruments the operator carried out the selection of electrodes to be employed for a specific reading, either manually, or through software, at the switch box.

Please replace paragraph [006] with the following replacement paragraph:

[006] In order to reduce the number of individual conductors in the field cables, software controlled switches have been introduced at each take-out point along the cable. These switches are programmed for connecting the desired electrodes to either the desired current conductors or the desired potential (measuring) conductors, based on multiple software addresses. For example, U.S. Patent No. 6,404,203, (M.S.B. Langmanson), discloses software-controlled contacts for creating the desired array geometry. This approach to software-controlled selective switching of electrodes in multi-electrode cables is utilized, for example, in the SARIS™, automated resistivity system of Scintrex, Limited, Concord Ontario, and in the Super-Sting™ resistivity instrument of Advanced Geoscience, Inc., Austin, Texas.

Please replace paragraph [019] with the following replacement paragraph:

[019] In Figure 1, reference character (1) denotes an apparatus for measuring electrical properties of the earth, including a generator (2) of electrical current having a predetermined waveform (commonly either a low frequency alternating, or direct current). The output of the generator (2) is connected across two conductors (3) and (4) in a multi-conductor cable (5). An electronic voltmeter (6) has an input connected to two further conductors (7) and (8) in the cable (5).

Please replace paragraph [020] with the following replacement paragraph:

[020] Along the cable (5), a series of electronic ~~switches~~ switching circuits (9) are located at selected intervals, commonly, but not invariably, at uniform distances, (e.g. 10m, 25m, or 50m along the cable). There may be as many such electronic switching circuits (9) as desired along the cable (5), depending on the length of the cable and the interval between the switches. As will be described below, these circuits can be programmed, through coded software commands from a controller (10) in the apparatus (1). The command signals are transmitted along a third pair of conductors (11) and (12) in cable (5), so as to connect any desired combination of conductors (3), (4), (7) and (8) to ground through electrodes (13) at the switch locations. The coded command signals identify which of the switching circuits are to be activated for that measurement, and which conductors (3), (4), (7) or (8) are to be grounded, by the individual switches (14), to electrodes (13).

Please replace paragraph [021] with the following replacement paragraph:

[021] Figure 2 is a schematic flow chart illustrating how, by software command, a selection can be made of the specific electrode (13) that will be connected to a specific conductor (3, 4, 7, or 8). Controller (10) transmits (from left to right along the cable (5) in

Figure 2) a coded command containing two parts. The first of these parts pertains to the address of the electrode (13) to be selected as a ground, and the second part contains the information as to which of conductors (3, 4, 7, or 8) is to be grounded at that electrode. For illustration purposes only, the first (electrode selective) part of the coded command may represent the distance (measured in numbers of electrodes) from the controller (10). For example, if the electrode to be addressed is the nth electrode from the controller (10), then as the command passes to the right down the series of switching circuits (electrodes) on the cable, each such switching circuit (9) modifies the command by reducing the number of this address, and retransmits the modified command to the next electrode in the series, (e.g. with first address n-1, n-2, etc). When the command arrives at the nth electrode, its first address is "1". The switching circuit (9) of the nth electrode recognizes "1" as a command to be executed. The second component in the command (y) determines which of the conductors is to be switched to ground at that electrode.

Please replace paragraph [022] with the following replacement paragraph:

[022] Figure 3 shows, in greater detail, a switching circuit (9) for selection of the conductor to be grounded. In each of the switching circuits (9) there are four individual switches (14) (labeled S3, S4, S7, and S8 in Figure 3), one side of each of which is connected to the conductor of the same number. The other sides of all of the switches (14) are connected to ground at the local electrode (13). The second part of the software command (y) then determines which one of these four switches is closed for a particular measurement.

Please replace paragraph [025] with the following replacement paragraph:

[025] Figure 4 shows such an enhanced alternative embodiment, incorporating a second voltmeter (15) connected across two additional conductors (16) and (17). Each

switching circuit (9) includes two additional software controlled switches S16 and S17 for connecting conductors (16) or (17) to ground, as and where required, to obtain a simultaneous second measurement of the electrical characteristics of the earth across a second dipole on the survey line.